

REMARKS

Claims 1 and 24 have been amended to bring them into line with the amendments made during the International Phase in this application. No new matter is entered.

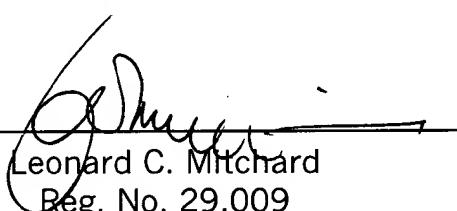
Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page/s is/are captioned "Version With Markings To Show Changes Made."

Action on this application is awaited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____



Leonard C. Mitchard
Reg. No. 29,009

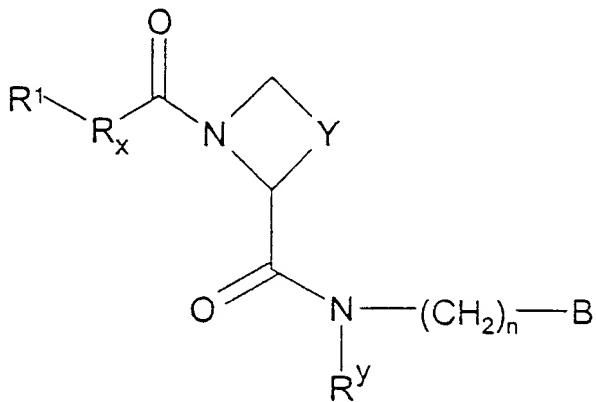
LCM:lks
1100 North Glebe Road, 8th Floor
Arlington, VA 22201-4714
Telephone: (703) 816-4000
Facsimile: (703) 816-4100



VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

1. (Amended) A compound of formula I,



wherein

R¹ represents H, C₁₋₄ alkyl (optionally substituted by one or more substituents selected from cyano, halo, OH, C(O)OR^{1a} or C(O)N(R^{1b})R^{1c}) or OR^{1d};

R^{1d} represents H, C(O)R¹¹, SiR¹²R¹³R¹⁴ or C₁₋₆ alkyl, which latter group is optionally substituted or terminated by one or more substituent selected from OR¹⁵ or (CH₂)_qR¹⁶;

R¹², R¹³ and R¹⁴ independently represent H, phenyl or C₁₋₆ alkyl;

R¹⁶ represents C₁₋₄ alkyl, phenyl, OH, C(O)OR¹⁷ or C(O)N(H)R¹⁸;

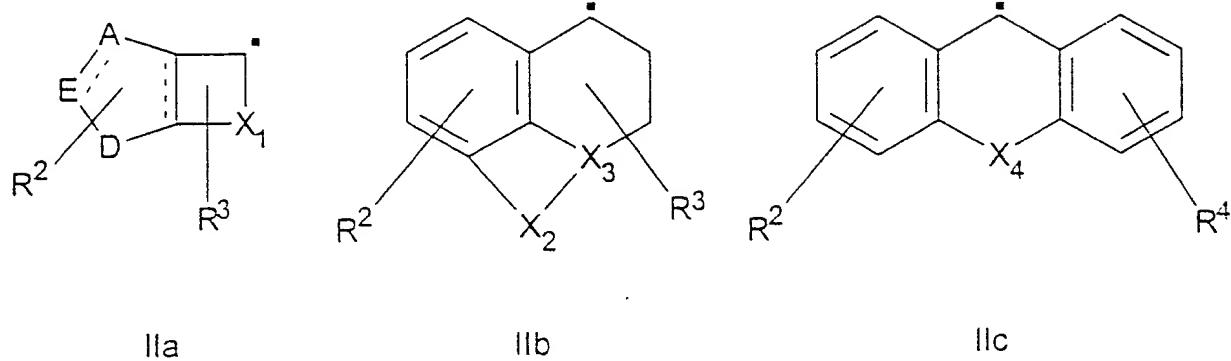
R¹⁸ represents H, C₁₋₄ alkyl or CH₂C(O)OR¹⁹;

R¹⁵ and R¹⁷ independently represent H, C₁₋₆ alkyl or C₁₋₃ alkylphenyl;

R^{1a}, R^{1b}, R^{1c}, R¹¹ and R¹⁹ independently represent H or C₁₋₄ alkyl; and

q represents 0, 1 or 2;

R_x represents a structural fragment of formula IIa, IIb or IIc,



wherein

the dotted lines independently represent optional bonds;

A and E independently represent O or S, CH or CH₂ (as appropriate), or N or N(R²¹) (as appropriate);

D represents -CH₂-, O, S, N(R²²), -(CH₂)₂-; -CH=CH-, -CH₂N(R²²)-, -N(R²²)CH₂-; -CH=N-, -N=CH-, -CH₂O-, -OCH₂-; -CH₂S- or -SCH₂-;

X₁ represents C₂₋₄ alkylene; C₂₋₃ alkylene interrupted by Z; -C(O)-Z-A¹-; -Z-C(O)-A¹-; -CH₂-C(O)-A¹-; -Z-C(O)-Z-A²-; -CH₂-Z-C(O)-A²-; -Z-CH₂-C(O)-A²-; -Z-CH₂-S(O)_m-A²-; -C(O)-A³; -Z-A³-; or -A³-Z-;

X₂ represents C₂₋₃ alkylene, -C(O)-A⁴- or -A⁴-C(O)-;

X₃ represents CH or N;

X₄ represents a single bond, O, S, C(O), N(R²³), -CH(R²³)-, -CH(R²³)-CH(R²⁴)- or -C(R²³)=C(R²⁴)-;

A¹ represents a single bond or C₁₋₂ alkylene;

A² represents a single bond or -CH₂-;

A³ represents C₁₋₃ alkylene;

A⁴ represents C(O) or C₁₋₂ alkylene;

Z represents, at each occurrence, O, S(O)_m or N(R²⁵);

R² and R⁴ independently represent one or more optional substituents

selected from C₁₋₄ alkyl, C₁₋₄ alkoxy (which latter two groups are optionally substituted by one or more halo substituent), methylenedioxy, halo, hydroxy, cyano, nitro, S(O)₂NH₂, C(O)OR²⁶, SR²⁶, S(O)R^{26a}, S(O)₂R^{26a} or N(R²⁷)R²⁸;

R³ represents one or more optional substituents selected from OH, C₁₋₄ alkoxy, C₁₋₆ alkyl (optionally substituted by one or more halo group), or N(R^{29a})R^{29b};

R²⁵, R^{29a} and R^{29b} independently represent H, C₁₋₄ alkyl or C(O)R³⁰;

R²⁶ represents H or C₁₋₄ alkyl;

R^{26a} represents C₁₋₄ alkyl;

R²⁷ and R²⁸ independently represent H, C₁₋₄ alkyl or C(O)R³⁰, or together represent C₃₋₆ alkylene, thus forming a 4- to 7-membered ring, which ring is optionally substituted, on a carbon atom that is α to the nitrogen atom, with an =O group;

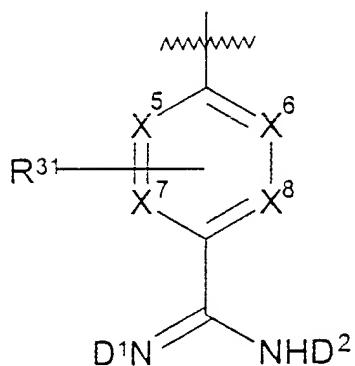
R²¹, R²², R²³, R²⁴ and R³⁰ independently represent, at each occurrence, H or C₁₋₄ alkyl;

Y represents CH₂, (CH₂)₂, CH=CH (which latter group is optionally substituted by C₁₋₄ alkyl), (CH₂)₃, CH₂CH=CH or CH=CHCH₂ (which latter three groups are optionally substituted by C₁₋₄ alkyl, methylene, =O or hydroxy);

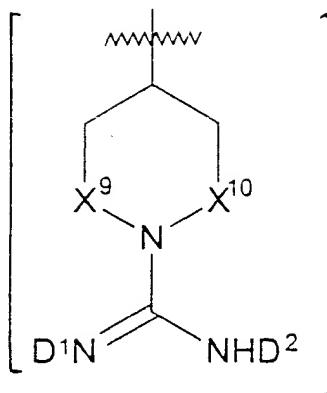
R^y represents H or C₁₋₄ alkyl;

n represents 0, 1, 2, 3 or 4; and

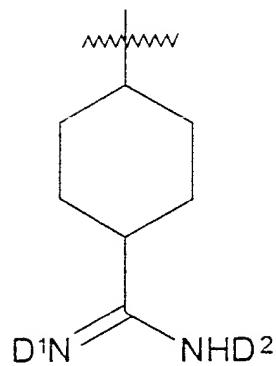
B represents a structural fragment of formula IIIa[IIIb]or]IIIc



IIIa



IIIb



IIIc

wherein

X⁵, X⁶, X⁷ and X⁸ independently represent CH, N or N-O;

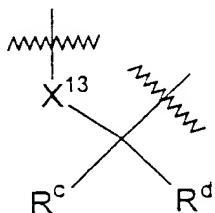
[X⁹ and X¹⁰ independently represent a single bond or CH₂;]

R³¹ represents an optional substituent selected from halo, C₁₋₄ alkyl (which group is optionally substituted by one or more halo group), N(R³²)R³³, OR³⁴ or SR³⁵;

R³² and R³³ independently represent H, C₁₋₄ alkyl or C(O)R³⁶;

R³⁴, R³⁵ and R³⁶ independently represent H or C₁₋₄ alkyl; and

one of D¹ and D² represents H, and the other represents H, OR^a, NHR^a, C(=X¹¹)X¹²R^b, or D¹ and D² together represent a structural fragment of formula IVa:-



IVa

R^a represents H or -A⁵[X¹⁴]_n[C(O)]_rR^e;

R^b represents -A⁵[X¹⁴]_n[C(O)]_rR^e;

A⁵ represents, at each occurrence, a single bond or C₁₋₁₂ alkylene (which alkylene group is optionally interrupted by one or more O, S(O)_m and/or

N(R^f) group, and is optionally substituted by one or more of halo, OH, N(H)C(O)R^g, C(O)N(R^g)R^h, C₃₋₇-cycloalkyl (which cycloalkyl group is optionally interrupted by one or more O, S(O)_m and/or N(R^f) group and/or is optionally substituted by one or more substituents selected from C₁₋₆ alkyl, C₁₋₆ alkoxy, halo, =O or =S), Het and C₆₋₁₀ aryl (which aryl and Het groups are themselves optionally substituted by one or more substituents selected from C₁₋₆ alkyl (optionally substituted by one or more halo substituent), C₁₋₆ alkoxy, halo, cyano, C(O)OR^g, C(O)N(R^g)R^h and N(R^f)R^g);

R^c and R^d both represent H; or one of R^c and R^d represents H or C₁₋₇ alkoxy and the other represents C₁₋₇ alkyl (which alkyl group is optionally interrupted by one or more O atoms); or R^c and R^d together represent C₃₋₈ cycloalkyl, which cycloalkyl group is interrupted by one or more O, S(O)_m and/or N(R^f) group;

R^e represents, at each occurrence, H, C₁₋₁₂ alkyl (which alkyl group is optionally interrupted by one or more O, S(O)_m and/or N(R^f) group, and/or is optionally substituted by one or more substituents selected from halo, OH, N(H)C(O)R^g and C(O)N(R^g)R^h), A⁷-C₃₋₇-cycloalkyl (which cycloalkyl group is optionally interrupted by one or more O, S(O)_m and/or N(R^f) group and/or is substituted by one or more substituents selected from C₁₋₆ alkyl, C₁₋₆ alkoxy, halo, =O and =S), A⁷-C₆₋₁₀ aryl or A⁷-Het (which aryl and Het groups are optionally substituted by one or more substituents selected from C₁₋₆ alkyl (optionally substituted by one or more halo substituent), C₁₋₆ alkoxy, halo, cyano, C(O)OR^g, C(O)N(R^g)R^h and N(R^f)R^g);

A⁷ represents a single bond or C₁₋₇ alkylene (which alkylene group is optionally interrupted by one or more O, S(O)_m and/or N(R^f) group, and/or are optionally substituted by one or more of halo, OH, N(H)COR^g and CON(R^g)R^h);

Het represents, at each occurrence, a five- to ten-membered heteroaryl group, which may be aromatic in character, containing one or more nitrogen, oxygen or sulphur atoms in the ring system;

n and r independently represent 0 or 1;

X¹¹, X¹² and X¹⁴ independently represent O or S;

X¹³ represents O or N(R^f);

R^f represents, at each occurrence, H, C₁₋₄ alkyl or C(O)R^g;

R^g and R^h independently represent, at each occurrence, H or C₁₋₄ alkyl;
and

m represents, at each occurrence, 0, 1 or 2;

or a pharmaceutically acceptable salt thereof;

provided that:

- (a) A and E do not both represent O or S;
- (b) E and D do not both represent O or S;
- (c) when R¹ represents OR^{1d} and X₁ represents -C(O)-Z-A¹,
-Z-CH₂-S(O)_m-A²- or -Z-C(O)-Z-A², then A¹ or A² (as appropriate) do not
represent a single bond;
- (f) when X₄ represents -CH(R²³)-, R¹ does not represent OH;
- (g) when A⁵ represents a single bond, then n and r both represent 0;
- (f) when A⁵ represents C₁₋₁₂ alkylene, then n represents 1;
- (g) when A⁵ represents -CH₂-, n is 1 and r is 0, then R^e does not represent
H; and
- (h) the compound is not:-
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Pro-Pab;
(R)- or (S)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Pro-Pab;
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab x HOAc;

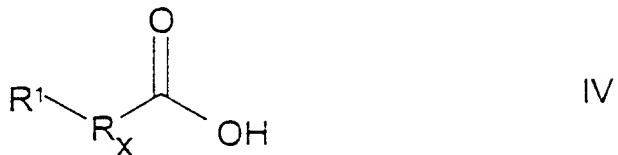
(R)- or (S)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab;
1-hydroxy-5-methoxytetralin-1-yl-C(O)-Aze-Pab x HOAc;
1-hydroxy-5,7-dimethyltetralin-1-yl-C(O)-Aze-Pab x HOAc;
1-hydroxy-7-aminotetralin-1-yl-C(O)-Aze-Pab x HOAc;
1-hydroxytetralin-1-yl-C(O)-Aze-Pab x HOAc;
7-methoxytetralin-1-yl-C(O)-Aze-Pab x HOAc;
(R)- or (S)-7-methoxy-1-methyltetralin-1-yl-C(O)-Aze-Pab;
4-hydroxy-6-methoxychroman-4-yl-C(O)-Aze-Pab x OAc;
(S)- or (R)-1-hydroxy-4-methoxyindan-1-yl-C(O)-Aze-Pab;
1-hydroxy-5-methoxytetralin-1-yl-C(O)-Aze-Pab(OH);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(OH);
4-hydroxy-6-methoxychroman-4-yl-C(O)-Aze-Pab(OH);
4-hydroxy-6-methoxychroman-4-yl-C(O)-Aze-Pab(OMe);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab-(C(O)OCH₂CCl₃);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab-(C(O)OCH₂CH₃);
7-methoxy-1-allyltetralin-1-yl-C(O)-Aze-Pab x HOAc;
(S)- or (R)-1-hydroxy-7-chlorotetralin-1-yl-C(O)-Pro-Pab;
1-n-propyl-7-methoxytetralin-1-yl-C(O)-Aze-Pab x HOAc;
6-chloro-4-hydroxychroman-4-yl-C(O)-Aze-Pab x HOAc;
4-hydroxychroman-4-yl-C(O)-Aze-Pab x HOAc;
6,8-dichloro-4-hydroxychroman-4-yl-C(O)-Aze-Pab x HOAc;
6-fluoro-4-hydroxychroman-4-yl-C(O)-Aze-Pab x HOAc;
4-hydroxy-6-methylchroman-4-yl-C(O)-Aze-Pab x HOAc;
8-chloro-4-hydroxy-6-methoxychroman-4-yl-C(O)-Aze-Pab x HOAc;
6-chloro-4-hydroxy-8-methylchroman-4-yl-C(O)-Aze-Pab x HOAc;
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(O-C(O)-i-Pr);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(O-C(O)-Et);

(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(O-C(O)-Ch);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(O-allyl);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(O-Bzl);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab-
(CO-O-methallyl);
1-hydroxy-7-aminotetralin-1-yl-C(O)-Aze-Pab(OH);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-Pab(O-Val);
(S)- or (R)-1-hydroxy-7-methoxytetralin-1-yl-C(O)-Aze-(Me)Pab; or
9-hydroxyfluoren-9-yl-C(O)-Aze-Pab x HOAc.

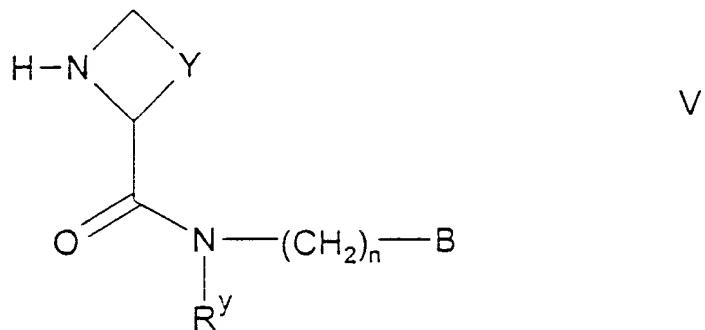
24. (Amended) A process for the preparation of formula I which

comprises:

(i) the coupling of a compound of formula IV,

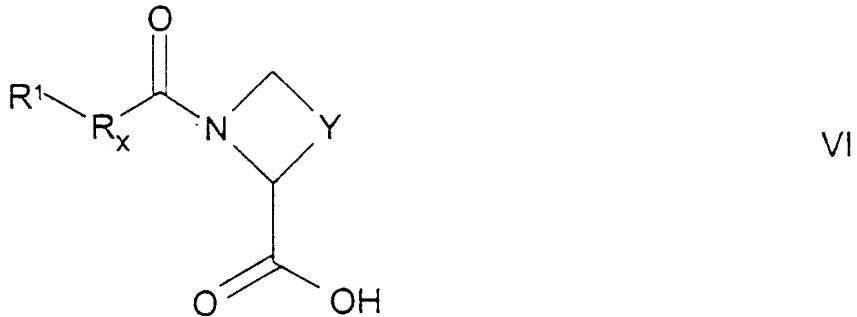


wherein R¹ and R_x are as defined in Claim 1 with a compound of formula V,



wherein R^y, Y, n and B are as defined in Claim 1;

(ii) the coupling of a compound of formula VI,

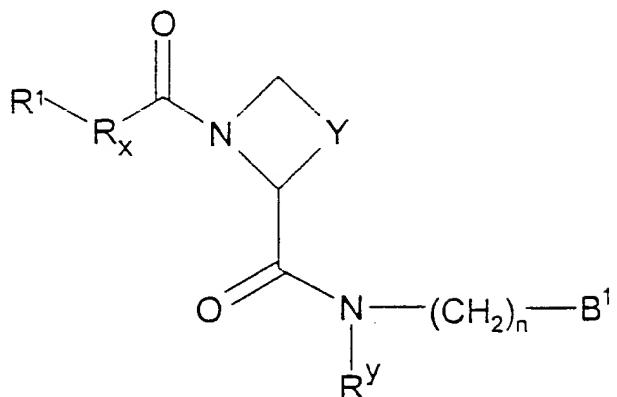


wherein R¹, R_x and Y are as defined in Claim 1 with a compound of formula VII,



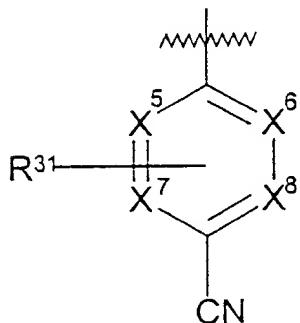
wherein R^y, n and B are as defined in Claim 1;

(iii) for compounds of formula I in which D¹ or D² represents OR^a or NHR^a, reaction of a compound of formula VIII,

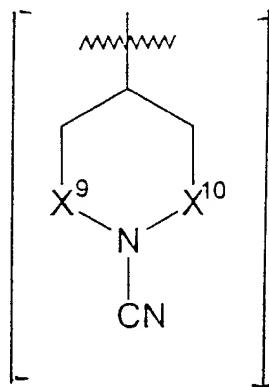


VIII

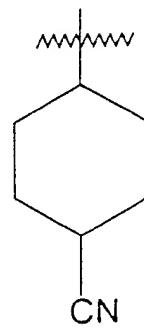
wherein B^1 represents a structural fragment of formula IIId, IIIe or IIIf



III d



III e



III f

and R^1 , R_x , Y , R^y , n , R^{31} , X^5 , X^6 , X^7 [X^8 , X^9] and X^{10} ⁸ are as defined in Claim 1 with a compound of formula IX,

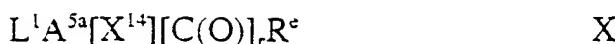


wherein X^a represents O or NH and R^a is as defined in Claim 1;

(iv) for compounds of formula I in which D^1 or D^2 represents OR^a or NHR^a , reaction of a compound of formula I in which D^1 or D^2 (as appropriate) represents $C(O)OR^{b1}$, in which R^{b1} represents a protecting group with a compound of formula IX as defined above;

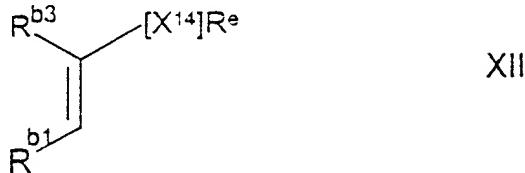
(v) for compounds of formula I in which D^1 or D^2 represents OR^a or NHR^a , R^a represents $-A^5[X^{14}]_n[C(O)]_rR^c$, in which A^5 does not represent a single bond, and n represent 1, reaction of a compound of formula I in which D^1 or D^2 (as appropriate) represents OH or NH_2 , with a compound

of formula X,



wherein L^1 represents a suitable leaving group, A^{5a} represents A^5 , as defined in Claim 1 except that it does not represent a single bond, and X^{14} , r and R^e are as defined in Claim 1;

(vi) for compounds of formula I in which D^1 or D^2 represents OR^a or NHR^a , R^a represents $-A^5[X^{14}]_n[C(O)]_r R^e$, in which A^5 represents C_{2-12} alkylene, which alkylene group is branched at the carbon atom that is α to the O or N atom of OR^a or NHR^a (as appropriate), and which group is optionally branched at the carbon atom that is β to that atom, n represents 1, r represents 0 and R^e is as defined in Claim 1, reaction of a compound of formula I in which D^1 or D^2 (as appropriate) represents OH or NH_2 , with a compound of formula XI,



or a geometrical isomer thereof, or a mixture of such geometrical isomers, in which R^{b1} and R^{b3} each represent H or an alkyl group, provided that the total number of carbon atoms provided by R^{b1} and R^{b3} does not exceed 10, and wherein X^{14} and R^e are as defined in Claim 1;

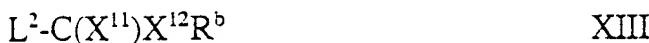
(vii) for compounds of formula I in which D^1 or D^2 represents OR^a or NHR^a , R^a represents $-A^5[X^{14}]_n[C(O)]_r R^e$, in which A^5 represents a single bond, and R^e represents A^7-C_{3-6} -cycloalkyl, in which A^7 represents a single bond, and the cycloalkyl group is interrupted by at least one O or S atom, which atom is between the carbon atom at the point of attachment to the O or NH group of OR^a or NHR^a , and a carbon atom that is α to that point of attachment, and which cycloalkyl group is optionally interrupted by one or more O or $S(O)_m$ group and/or optionally substituted by one or

more =O group, reaction of a compound of formula I, in which D¹ or D² (as appropriate) represents OH or NH₂, with a compound of formula XII,



wherein X¹⁵ represents O or S and X¹⁶ represents C₁₋₄ alkylene (which alkylene group is optionally interrupted by one or more O or S(O)_m group and/or optionally substituted by one or more =O group);

(viii) for compounds of formula I in which D¹ or D² represents C(X¹¹)X¹²R^b, reaction of a compound of formula I in which D¹ and D² both represent H with a compound of formula XIII,



wherein L² represents a suitable leaving group, and X¹¹, X¹² and R^b are as defined in Claim 1;

(ix) for compounds of formula I in which D¹ and D² together represent a structural fragment of formula IVa, reaction of a corresponding compound of formula I in which D¹ or D² represents OH or NHR^f (in which R^f is as defined in Claim 1), with a compound of formula XV,



wherein R^{c1} and R^{c2} both represent -OR^{c3}, in which R^{c3} represents C₁₋₃ alkyl, or together represent =O, and R^c and R^d are as defined in Claim 1;

(x) for compounds of formula I in which one or more of X⁵, X⁶, X⁷ and X⁸ represent N-O, oxidation of a corresponding compound of formula I in which X⁵, X⁶, X⁷ and/or X⁸ (as appropriate) represent(s) N; or

(xi) for compounds of formula I in which any one of Z, X₁, R², R⁴, A⁵, A⁷, R^c, R^d and/or R^e comprises or includes a S(O) or a S(O)₂ group, oxidation of a corresponding compound of formula I (or a compound corresponding to a compound of formula I) wherein Z, X₁, R², R⁴, A⁵, A⁷, R^c, R^d and/or R^e (as appropriate) comprise(s) or include(s) a S group;

- (xii) for compounds of formula I in which D¹ and D² both represent H, removal of a OR^a, NHR^a or C(=X¹¹)X¹²R^b group (in which R^a, R^b, X¹¹ and X¹² are as defined in Claim 1), or removal of a structural fragment of formula IVa as defined in Claim 1, from a corresponding compound of formula I; or
- (xiii) introduction and/or interconversion of a substituent on an aromatic and/or non-aromatic, carbocyclic and/or heterocyclic ring in a corresponding compound of formula I.